Knop's solution.—TOOLE and TOTTINGHAM[5] find that additions of $Fe(OH)_3$ to Knop's solution greatly increases the growth of barley tops in it (21 day cultures), while additions of carbon black depress the growth of tops and additions of H_2SiO_3 have no effect. None of these additions affect the growth of the roots. Part of the beneficial action of the $Fe(OH)_3$ may be due to its neutralizing action on the acids of the solution. It is interesting to note that the higher additions of $Fe(OH)_3$ removed 90 per cent of the phosphorus from solution.

In another piece of work, TOTTINGHAM[6] has shown that he can displace more than 90 per cent of the $MgSO_4$ of Knop's solution with $Mg(NO_3)_2$ without interfering with the growth of red clover, a rather heavy sulphur requiring plant. It is evident that some of the nutrients in the commonly used nutrient solutions are far beyond the minimum concentration necessary to give the plant its optimum supply, and that the so-called optimum concentration of the solution is determined by other factors than optimum supply. The conditions of and the mechanism for absorption from the soil (root hairs with their acid pectic layer in contact with soil particles bearing certain nutrients in compounds of low solubility) are quite different. Work with water cultures has established some very fundamental principles in soil fertility (essential nutrient elements, necessity of balanced solutions, etc.). It is a question how much more this method alone is capable of adding to our knowledge of soil fertility. In the present concentrated nutrient solutions with which we are working we may be mainly playing the toxic concentration of one salt against the toxic concentration of another in a way to get the least possible injury.—WM. CROCKER.

Chromosomes in Carex.—Oogenesis and spermatogenesis have been studied by HEILBORN[7] in several species of *Carex*, special attention being given to chromosome numbers, which vary greatly in this genus. The gametophyte numbers in the forms investigated are as follows: *Carex pilulifera* 8, *C. ericetorum* 16, *C. digitata* 24, *C. caryophylla* and *C. flava* 32. JUEL had already reported 52 for *C. acuta*, and STOUT 37 for *C. aquatilis*. It is interesting to note that *C. pilulifera* has the largest chromosomes, and that in species with higher numbers the chromosomes are correspondingly smaller. Attempts to cross the various species have not yet proved successful, but the work is still in progress.—C. J. CHAMBERLAIN.

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[5] TOOLE E. H., and TOTTINGHAM, W. E., The influence of certain added solids upon the composition and efficiency of Knop's nutrient solution. Amer. Jour. Bot. **5**:452–461. 1918.

[6] TOTTINGHAM, W. E., Sulfur requirement of red clover plant. Jour. Biol. Chem. **36**:429–438. 1918.

[7] HEILBORN, OTTO, Zur Embryologie und Zytologie einiger *Carex*-Arten. Svensk Botanisk Tidskrift **12**:212–220. *figs. 1–14*. 1918.